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Referring again to FIG. 1, slider 101 and slider 102 each include a keypad and thus are examples of a keypad slider. A membrane keypad may be preferred. Drive current and signals generated by the keypad may be coupled to the display/processor 100 by a flexible ribbon connector or sliding contacts. Alternatively, signals between the sliders and display processor 100 may be optically coupled (e.g., a light emitting diode and detector pair).

FIG. 3A shows a handheld data processing device with a display 300 that has a display orientation controller. The display orientation controller selects between two orthogonal display modes (e.g., portrait and landscape.) The portion of text 301 is displayed in portrait mode in FIG. 3A, whereas FIG. 3B shows a display 300 with a portion of text 303 that is displayed in landscape mode. It is appreciated that the display or portrait or landscape mode may be selected based on a user command, or, it may be automatically selected based on the orientation of the device.

The display 300 may also include a line selection driver for executing commands by using a slider to reference a line on the display. As shown in FIG. 3A, a "macro command" 302 is aligned with the edge of a slider 312 and is therefore selected. A macro command is a character string that refers to an executable command or series of commands. For example, the character string may be an email address or telephone number that may be selected for sending an email or initiating a telephone call. Once selected, the macro command may be executed by appropriate input (e.g., a keystroke or contact with a touch panel display).

FIG. 4A shows a rear view of the handheld wireless device, e.g., here a telephone, with a sliding form factor in an open position in accordance with an embodiment of the present claimed invention. The telephone has three basic components: a transceiver module 400, a first slider 401 and a second slider 402. The three components are similar to the three components shown in FIG. 1, and the wireless telephone may of FIG. 4A may be integrated with the data processing device of FIG. 1, with FIG. 4A providing a rear view of the integrated device to complement the front view provided by FIG. 1.

The first slider 401 includes a microphone 403 and is electrically and/or optically coupled to the transceiver module 400. The sliding interface between the slider 401 and the transceiver module 400 preferably incorporates a detent mechanism to enable repeatable and stable positioning of the slider 401 with respect to the transceiver module 400. In an integrated device, the microphone may also serve as an input device for voice recognition or recording.

The second slider 402 includes a speaker 404 and is electrically and/or optically coupled to the transceiver module 400. The sliding interface between the slider 401 and the transceiver module 400 preferably incorporates a detent mechanism to enable repeatable and stable positioning of the slider 402 with respect to the transceiver module 400. In an integrated device, the speaker may also serve as an output for stored audio program material or real-time broadcast audio material.

FIG. 4B shows a handheld wireless telephone with a sliding form factor in a closed position in accordance with an embodiment of the present claimed invention. For an integrated device, the view shown in FIG. 4B corresponds to the view shown in FIG. 2, wherein the front side of the integrated device is represented by FIG. 2 and the back side is represented by FIG. 4B.

In the integration of a wireless telephone and a data processing device with a display, there is a distinct advantage in allocating the telephony functions to the side oppo-

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site of the display side. Contact between a user's skin will tend to contaminate the a display surface, and contact between the user and the telephone is typically desirable in order to enhance the intelligibility of conversation and screen out ambient noise. In addition to the microphone 403 shown on slider 401, a second microphone may be included on the opposite side in an integrated device so that audio input such as speech could be input while looking at a display. In order to reduce noise, one microphone or the other may be automatically selected by the application that is currently being used (e.g., telephony or voice commands).

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the invention and its practical application, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the claims appended hereto and their equivalents.

The invention claimed is:

1. A handheld data processing device comprising:

- a display/processor module comprising a single piece display and a processor;
- a first keypad slider comprising a keypad and a first transparent window, slidably coupled to said display/processor module; and,
- a second keypad slider comprising a keypad and a second transparent window, slidably coupled to said display/processor module, and wherein said first keypad slider and said second keypad slider substantially cover said display of said display/processor module and permit viewing a substantial portion of said display through said first transparent window and said second transparent window when they are in a closed position and wherein said processor adjusts the visible area of said display relative to the position of said first keypad slider and relative to the position of said second keypad slider.

2. The handheld data processor device of claim 1, further comprising a display orientation controller.

3. The handheld data processor device of claim 1, wherein said first keypad slider is electrically coupled to said display/processor module by a flexible ribbon connector.

4. The handheld data processor device of claim 1, wherein said first keypad slider is optically coupled to said display/processor module.

5. The handheld data processor device of claim 1, further comprising a detent mechanism for enabling repeatable and stable extension of the handheld data processing device.

6. The handheld data processor device of claim 1, wherein said first keypad slider includes a microphone.

7. The handheld data processor device of claim 6, further including a voice recognition processor.

8. The handheld data processor device of claim 1, wherein said first keypad slider includes a speaker.

9. The handheld data processor device of claim 8, wherein said second keypad slider includes a microphone.

10. The handheld data processor device of claim 1, further comprising a wireless transmitter.

11. The handheld data processor device of claim 1, further comprising a wireless receiver.